1.1.1.1.1.13 Chapter 14

14. Aircrew Coordination

Many professional studies have proven that properly trained team members can collectively perform complex tasks better and make more accurate decisions than the single best performer on the team. Conversely, the untrained team's overall performance can be significantly worse than the performance of its weakest single member. This chapter will cover aspects and attitudes of teamwork and communication among team members.

14.1 Team Concept and Communication

Until recently, the study of crew coordination principles was limited to studying flight crew performance. However, over the last decade, the number of preventable operator-caused errors leading to accidents has led both the military and commercial aviation communities to expand the study. Airline and military crew resource training now emphases and encourages the pilot or aircraft commander to include *all* assets and sources of information in the decision-making process. The general assumption is that as more information becomes available, more accurate decisions are more likely and operator errors will be reduced.

The same general principles of crew coordination and resource management apply to all the members of the search and rescue team. Incident commanders, flight planners, operations officers, pilots, mission observers, scanners, air traffic controllers, and flight service station personnel should all be considered sources for appropriate information by the air team.

In order for any information to be used, it must be effectively communicated. The effective communication process that leads to good crew coordination actually starts well before a flight begins. Each member must pay close attention during briefings. A clear understanding of the "big picture," search objective, altitudes, area assignments, and search patterns to be used *prior* to departure will preclude questions and debate in flight, when other tasks should take higher priority. Crewmembers having questions are encouraged to ask them at this time.

Search assignments and procedures should be clearly stated to the crews, and crewmembers are encouraged to offer their own ideas. Planning officers should answer each question openly and non-defensively, and you should also make every effort to seek complete understanding of each situation.

In developing the actual search mission plan, workload management and task distribution are very important. An over-tasked crewmember may not develop a complete grasp of mission aspects that later may affect his performance. Remain alert for over-tasking in other crewmembers, and offer help if possible. If you find yourself over-tasked, do not hesitate to ask another qualified member for help. Each team member must continually think “teamwork.”

Close attention should be paid during the pilot's briefing. The pilot will establish flight-specific safety rules at this time, such as emergency duties and division of responsibilities. Each individual must again clearly understand her specific duties and responsibilities before proceeding to the aircraft.

In assigning scanning responsibilities to the scanners, mission observers must be receptive to questions and suggestions from the scanners. Carefully consider suggestions. It is important to remember that suggestions are almost always offered constructively, and are not intended to be critical. Answer questions thoroughly and openly, and don't become defensive. Again, doubts or questions that you can't answer should be resolved before continuing to the aircraft.

During the pilot's preflight inspection of the aircraft you may notice or suspect a defect in the aircraft's condition that the pilot may have overlooked. You should wait until the inspection is complete (so you don't distract the pilot) and then call it to the pilot's attention.

Other phases of the flight also require that distractions be kept to a minimum. Recent air transport industry statistics show that 67% of airline accidents during a particular survey period happened during only 17% of the flight time -- the taxi, takeoff, climb, approach and landing phases. The FAA has designated these phases of flight as critical, and has ruled that the cockpit environment *must* be free of extraneous activity and distractions during these phases to the maximum extent possible. Regulations that apply only to airlines and commercial operators prohibit crewmembers from performing *any* duties during these phases that are not specifically required for safe operation of the aircraft.

These regulations don't apply to aircraft operated by the CAP, but many pilots have embraced the intent of the regulations and may expect the observer and scanner to act accordingly. Casual conversation should be kept to an absolute minimum during the taxi, takeoff, approach and landing phases. This not only allows for fewer distractions that might interfere with completion of checklists, but will also allow *all* crew members to more clearly hear mission base or air traffic control instructions through the airplane's radio. The pilot may include, as a part of his briefing, instructions to the other members on this topic. If he does not, the courteous crewmember will inquire concerning the pilot's wishes. Casual conversation during other phases of a flight is permitted (and often encouraged) to the extent that it does not interfere with accomplishing job- and mission-related tasks.

During the taxi, takeoff, transit, approach and landing phases all crewmembers should be looking out for other traffic.

14.2 Crew efficiency

Crew efficiency is determined by factors such as the level of training and experience, the completeness of briefings, how well each crewmember understands their duties, and each person's ability to anticipate problem areas and other crewmember's needs. We will discuss some factors that improve crew effectiveness.

Let's imagine that you are in the air over the assigned search area. Suddenly, your peripheral vision detects a flash of light coming from the right and toward the rear of the airplane. You direct your head and eyes to the general area. There it

is again. It might be coming from a survivor's signal mirror. How do you tell the pilot? First, you use the clock position to establish the clue's direction with regard to the airplane's direction of flight. Then, while keeping your eyes glued to the area of the possible search objective, you call out small directional changes. These directional changes are needed to get close to the clue without turning past it.

14.2.1 The Clock Positions

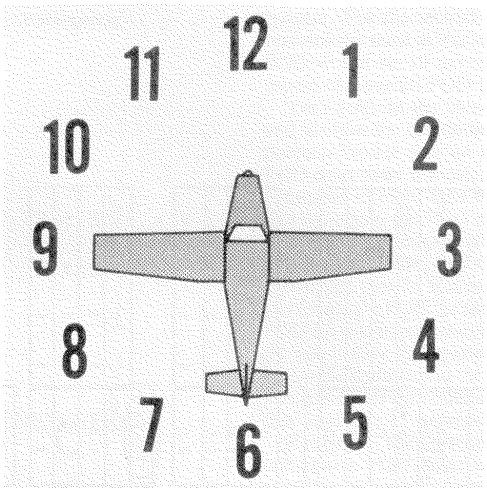

Figure 15-1

This system is used to describe the relative positions of everything outside the airplane. The system considers the clock positions to be on a horizontal plane that is centered within the cockpit. Any object above or below this plane is either "high" or "low."

Imagine yourself in the right rear seat of the airplane. Straight ahead is the twelve o'clock position; straight to the rear is six o'clock. In a real-life situation you probably would be able to see as far ahead as the one o'clock position and as far to the right as five o'clock. (One caution: never divide the clock positions into minutes. There is no such thing as a four-fifteen position.)

If you occupy the left-rear seat of the airplane, your clock positions probably will be seven o'clock through eleven o'clock. In either the right-rear or left-rear seat, the further designation "low" is not used for objects on the ground. They are low, but this is understood.

The clock positions are especially helpful in designating the location of other aircraft within your area of the airspace. Your pilot needs to see all other airplanes in the area so that he can keep clear of them. If you see another airplane, notify the pilot immediately. This time, the high and low designations are appropriate if the other airplane is considerably higher or lower than your altitude. For example, an airplane that is directly ahead but above your altitude should be called out as "aircraft twelve o'clock high."

The "clock position" method of reporting sightings is the standard way crewmembers communicate to each other the relative direction of an observation. It’s easy to learn, and the crewmembers only have to be familiar with the number positions on a clock’s face. Imagine the clock lying face up and the airplane sitting at the center with its nose pointing to the twelve o'clock position, as illustrated in Figure 1-2. You report sightings in the direction the clock's hour hand would be pointing, if pointing at the suspected site. With this method, all reports indicate the same relative direction to other crewmembers.

In spite of this system's relative simplicity, experienced crewmembers still make mistakes during stress or excitement. When reporting an observation to another crew member, one technique that helps keep mistakes to a minimum is to precede the clock position with either "left" or "right" as appropriate. While many people may mistake three and nine o'clock, few mistake left and right. Preceding

the clock position with the direction will more likely initially move all eyes in the proper direction. Let's look at some examples.

Also, for this particular situation, remember that you can press a button on the GPS to store the aircraft's present position. By noting that the flash occurred to the right and toward the rear of the airplane, you can recall the stored position and get close to the point where you saw the flash.

14.2.2 Directing the Pilot

Let's say that the flash of light came from the right rear, somewhere near the four o'clock position. You call out "possible at four o'clock." The pilot starts an immediate, medium-bank turn to the right. The pilot knows the four o'clock position but his concept and your concept of this position may not be exactly the same. It looks as if the pilot might swing past your four o'clock. Now what? Don't let it happen! Say something like "straight ahead and level," or "stop turn," or "wings level." The pilot will get the idea.

Getting close to the area of your clue will require small adjustments to direction. Again, tell the pilot what to do. Pilots are accustomed to turning according to numbers of degrees, as shown by the aircraft compass, so you might want to say "five degrees right," or "ten degrees right." The pilot will turn the number of degrees you specify, level off and hold the heading.

If you see what seems to be the search objective, again give the clock position plus other helpful information, such as "near clump of trees." The pilot will bank the airplane and descend to a lower altitude. At this lower altitude identification may be possible. If the clue turns out to be the search objective, mission headquarters will be notified by radio. Your search aircrew will try to remain in the area to direct ground teams to the site. If the clue is not the search objective, your pilot will return to the search track.

When your aircrew team locates a search objective, the scanner's duties change. He no longer needs to scan the ground, so he can keep a sharp lookout for other aircraft. The pilot and observer will be very busy flying the airplane at low level and communicating with other mission units. The preoccupation of the pilot and observer, plus the tendency of other aircraft to congregate at a crash site, leaves the scanners the responsibility for keeping clear of other aircraft.

14.2.3 Task Saturation, Situational Awareness, and Time Management

At times, crews or individual members may be confronted with too much information to manage, or too many tasks to accomplish in the available time. This condition is referred to by many as *task saturation*. This will most likely happen when a crewmember is confronted with a new or different situation, like an emergency, bad weather, or motion sickness. Preoccupation with the different situation may then lead to a condition of "tunnel vision," where the individual can lose track of many other important conditions. In an advanced state, comprehension is so degraded that partial or complete *situational awareness* is lost. When individuals are task saturated to such an extent, communications and the flow of information usually ceases.

The amount of work that any member can handle is directly related to training and experience. Each crewmember must try to keep his or her workload at an acceptable level. If you begin to feel overwhelmed by information or the sheer number of things to do, it's time to evaluate each task, and do only those tasks that are most important. If you ever feel over-tasked, you have an obligation to tell the other crewmembers *before* becoming task-saturated and losing your situational awareness. If others know your performance is suffering, they may assume some of the workload if they can. Once the most important tasks are accomplished and time permits, you can start to take back some of those tasks that were neglected earlier. Allocation of time and establishing priorities is known as *time management*.

Most people can recognize task saturation in themselves and understand how it can affect performance. However, you should also watch for these symptoms in other members of your crew and take over some of their responsibilities if you have the qualifications and can do so without placing your own duties at risk.

The pilot's job is to safely fly the aircraft, and you should be very concerned if she becomes task saturated, or spends an excessive amount of her time with tasks other than flying the airplane. No crewmember should ever allow the work management situation to deteriorate to such an extent as to adversely affect the pilot's ability to safely operate the aircraft. Many accidents have resulted from crews becoming involved in other areas or problems while the airplane literally flew into the ground. If any crew member suspects pilot task saturation to be the case, nonessential discussion should cease, and the crew as a whole should discontinue low-priority aspects of the job, and even return to the mission base if necessary.

14.3 In-flight emergencies

A significant part of each pilot’s training concerns how to handle in-flight emergencies. For the most part, the pilot will handle the problem and should not require a great deal of help from you. However, if the pilot asks you to help, follow his or her directions carefully. Above all, don’t add to the pilot’s concerns by asking too many questions or becoming overly upset. Very few in-flight emergencies are life threatening.

Don’t worry about continuing to scan or maintain the observer log. All crewmembers should be totally committed to helping the pilot safely handle the situation and get the aircraft on the ground. It’s a good idea to cover in-flight emergencies during the preflight briefing and make sure each crewmember knows what to do. The pilot may want you to read the emergency procedure from the checklist or make an emergency radio broadcast so he can focus on the aircraft problem, but that is something that should be agreed on before the flight begins

14.4 Barriers to Communication

Human factors may act as barriers to effective communication between team members, adversely affecting mission performance. Rank, gender, experience level, age, personality, and general attitudes can all cause barriers to communication. You may occasionally be hesitant to offer an idea for fear of

looking foolish or inexperienced. You may also be tempted to disregard ideas that come from individuals that have a lower experience level. If you are committed to teamwork and good crew coordination, you must look through such emotions and try to constructively and sensitively adapt to each personality involved.

You can deal best with personalities by continually showing personal and professional respect and courtesy to your teammates. Non-constructive criticism will only serve to build yet another barrier to good communication. Nothing breaks down a team effort faster than hostility and resentment. Always offer opinions or ideas respectfully and constructively. Instead of telling the pilot, "You're wrong," tell him what you *think* is wrong, such as "I think that new frequency was 127.5, not 127.9."

Personal factors, including individual proficiency and stress, may also create barriers to good communication. Skills and knowledge retention decrease over time, and that is why regular training is necessary. If you don't practice regularly, you very likely will spend a disproportionate amount of time on normal tasks, at the expense of communication and other tasks. Civil Air Patrol, the FAA, commercial airlines, and the military services all require certain minimum levels of periodic training for the sole purpose of maintaining proficiency.

Stress can have a very significant, negative effect on cockpit communication. An individual's preoccupation with personal, family, or job-related problems distracts him or her from paying complete attention to mission tasks and communication, depending upon the level and source of stress. The flight itself, personalities of the individuals, distractions, flight conditions, and individual performance can all be sources of communication-limiting stress. When stress reaches very high levels, it becomes an effective barrier to communication and job performance. Many fliers and medical specialists advocate refraining from flying or other complex tasks until the stress is removed.

In an emergency, there will likely be much more stress with which each crewmember must cope. Since very few emergencies result in immediate or rapid loss of an airplane, most experienced aviators recommend making a conscious effort to remain calm, taking the amount of time necessary to properly assess the situation, and only then taking the appropriate corrective action.

Part of your job is also to recognize when others are not communicating and not contributing to the collective decision-making process. Occasionally, other crewmembers may need to be actively brought back into the communication process. This can often be done with a simple "What do you think about that?" In a non-threatening way, this invites the teammate back into the communication circle, and, in most cases, he or she will rejoin the information loop.

Emerging technologies like data-linked freeze frame video (slow scan), digital cameras, and new avionics will challenge the observer to continually expand his skills. Gone are the days where the only mission requirement is a pair of Mark I eyeballs. You are an essential part of the CAP SAR team, and your training and practice will result in the most highly trained observers in CAP history.